

- Sub C1
- a) providing an array comprising a plurality of electrodes, at least one of which comprises an assay complex comprising:
 - i) a capture binding ligand covalently attached to said electrode;
 - ii) a target analyte; and
 - iii) an electron transfer moiety;
 - b) applying an electronic first input signal to said assay complex;
 - c) detecting an electronic output signal;
 - d) processing said detected output signal to determine the presence of said target analytes.

B1
cont

12. (Amended) A method of determining the presence of target analytes in a sample comprising:

- a) providing an array comprising a plurality of electrodes, at least one of which comprises an assay complex comprising:
 - i) a capture binding ligand covalently attached to said electrode;
 - ii) a target analyte; and
 - iii) an electron transfer moiety;
- b) applying an electronic first input signal to said assay complex;
- c) detecting an electronic output signal;
- d) processing said detected output signal to increase the signal-to-noise ratio and determine the presence of said target analyte.

13. (Amended) A method of determining the presence of target nucleic acid sequences in a sample comprising:

- a) providing an array comprising a plurality of electrodes, at least one of which comprises an assay complex comprising:

- i) a capture probe covalently attached to said electrode;
 - ii) a target sequence; and
 - iii) an electron transfer moiety;
- b) applying an electronic first input signal to said assay complex;
- c) detecting an electronic output signal;
- d) processing said detected output signal to determine the presence of said target sequences.

B1
cont
14. (Amended) A method according to claim 11 or 12 wherein said target analyte is a nucleic acid.

SubC2
15. (Amended) A method according to claim 11 or 12 wherein said target analyte is a protein.

B2
25. (Amended) A method according to claim 11, 12 or 13 wherein said input signal comprises an alternating current (AC) component and a direct current (DC) component.

27. (Amended) A method of determining the presence of target analytes in a sample comprising:

B3
a) providing an array comprising a plurality of electrodes, at least one of which comprises an assay complex comprising:

- i) a capture binding ligand covalently attached to said electrode;
 - ii) a target analyte; and
 - iii) an electron transfer moiety;
- b) applying a first input signal to said assay complex, wherein said input signal comprises the sum of multiple frequencies at a plurality of amplitudes;